

ABSTRACT OF THE DISCLOSURE

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5 A method for embedding fiber optic sensors in a high melting temperature metal structure produces embedded sensors that are uniformly and closely bonded with the metal and do not slip upon metal expansion and contraction. The structure is built in layers. A first thin metallic layer, approximately 1-3 μm thick, is sputter-coated onto the sensor. Next, a second thin layer, approximately 0.25-2 mm thick, is electroplated onto the first thin metallic layer. Finally, a metal structure is built around the thin metallic layers by laser cladding, casting, 10 welding, or other method. The embedded sensor is incorporated into a sensing system for measuring temperature, strain, or other properties of a metal structure. An optical system transmits light to and receives output signals from the sensor for analysis. With rotating structures, an optical fiber lead 15 transmits light between the sensor and external surface of the structure along its rotational axis, allowing the lead to remain fixed with respect to the optical system as the structure rotates at high speeds.

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